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Begonia ignita (sect. *Petermannia*, Begoniaceae), a new species with orange flowers from Sulawesi, Indonesia

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ABSTRACT. *Begonia ignita* C.W.Lin & C.I Peng, a new species of *Begonia* sect. *Petermannia* from Sulawesi, Indonesia, is here described and illustrated. It is distinct from other species in *Begonia* section *Petermannia* by a character combination including a procumbent stem ascending only at the apex, symmetric or subsymmetric leaves, the presence of a pale band or maculation running parallel to the leaf margin, and orange tepals. A detailed comparison with a morphologically similar species, the Sulawesi endemic *Begonia mendumiae* M.Hughes, is provided.

Keywords. *Begonia ignita*, *B. mendumiae*, Indonesia, new species, Sulawesi

Introduction

Forty-six species of *Begonia* are presently known from the Indonesian island of Sulawesi (Thomas et al., 2013), 22 of which have been described since 2006 (Hughes, 2006; Thomas & Hughes, 2008; Girmansyah et al., 2009; Thomas et al., 2009a, 2009b, 2011; Wiriadinata, 2013; Ardi et al., 2014). In addition, the examination of major herbarium collections (BO, E, L, K, SING) and specimen images from numerous additional herbaria provided by the *Begonia Resource Centre* (Hughes et al., 2015) indicates that there are many more species awaiting description. This high discovery rate is not surprising considering (i) that biological inventory rates and specimen collection density on Sulawesi are among the lowest in Indonesia (Cannon et al., 2007), (ii) the vast area (174,600 km^2) of the island, (iii) the markedly lower number of currently accepted species in comparison to the neighbouring Borneo: Sarawak (124,450 km^2 with c. 100 species of *Begonia*: Kiew et al., 2015) and Sabah (72,500 km^2 with 82 species: Kiew et al., 2015); Brunei (5,765 km^2 with 22 species: Joffre et al., 2015; Low et al., 2015); and (iv) the lack of a revision of central Malesian *Begonia*.

A very attractive orange-flowered *Begonia*, claimed to be of likely Sulawesi origin by some growers, has recently entered into cultivation inside and outside of Indonesia. It is immediately distinct from all other known Sulawesi species in its symmetric or subsymmetric leaves and orange or pale tangerine to vermilion tepals. In this study, we describe this species using measurements of herbarium specimens made from living plants in cultivation. In addition to the full taxonomic account, colour plates, line drawings, and a comparison to a phenetically similar species are provided to aid in identification.

Begonia ignita C.W.Lin & C.I Peng, **sp. nov.** § *Petermannia*
This species is distinct from other species in *Begonia* section *Petermannia* by a character combination including a procumbent stem ascending only at the apex, symmetric or subsymmetric leaves, the presence of a pale band or maculation running parallel to the leaf margin, and orange tepals. – TYPE: Collected in Indonesia, Sulawesi, precise locality unknown, grown in cultivation in Bogor Botanic Gardens and vouchered on 9 October 2016 as *Wisnu H. Ardi* WI 117 (holotype BO; isotype SING). (Fig. 1, 2)

Plant perennial, monoecious. ***Stem*** procumbent and rooting at nodes, ascending at the apex, olive to magenta, 8–20 cm long, 4–6 mm across, glabrous, internodes 0.5–5 cm long; *stipules* widely ovate-triangular, 8–12 mm long, c. 6 mm wide, hyaline, reddish, strongly keeled, margin entire, apex aristate, arista c. 2.5–4 mm long. ***Leaves*** 5–10, held horizontally; *petiole* terete, 3.5–8 cm long, 3.5–6 mm across, olive-red to crimson, sub-appressed sparsely velutinous, slightly grooved adaxially; *lamina* cordiform to widely cordiform, basifixed, symmetric or subsymmetric, cordate at base, margin slightly undulate and distantly denticulate, glabrous, apex acuminate, 7–12 cm long, 6.5–11 cm wide, basal lobes equal or subequal, to 2.5 cm long, thickly chartaceous, adaxially dark olive-green to dark maroon, embellished with a silvery green band (sometimes with irregular spots of variable sizes between veins) running parallel to the margin, veins red towards base; slightly rugose between primary veins; abaxially pale red to magenta; venation palmate-pinnate, midrib conspicuous, 6–9.5 cm long with c. 3 pairs of major lateral veins, each branching dichotomously. ***Inflorescence*** terminal, bisexual, protogynous, cymose-paniculate, 13–22 cm long; *bracts* magenta to pale rosy-brown, hyaline, persistent, widely ovate, (4–)8–12 mm long, (2–)4–7 mm wide, decreasing in size towards the more distal inflorescence nodes, aristate at apex, arista 3–4 mm long, margin entire; pistillate flowers produced on up to 3 subsequent basal nodes of the inflorescence, usually solitary or sometimes together with 1 staminate flower; staminate flowers usually only produced in distal inflorescence part, up to 15, in several (1–)2–3-flowered compressed monochasial partial inflorescences borne on short lateral branches (0.1–2 cm), at the most distal nodes sometimes reduced to a single flower, erect or ascending, reddish to crimson, glabrous. ***Staminate flower:*** pedicel 11–18 mm long, glabrous; *tepals* 2, orange or pale tangerine to vermilion, glabrous, widely ovate to suborbicular, margin entire, base rounded, 10–15 mm long, 9–11 mm wide; *androecium* subzygomorphic, stamens 35–45, yellow, filaments shortly fused

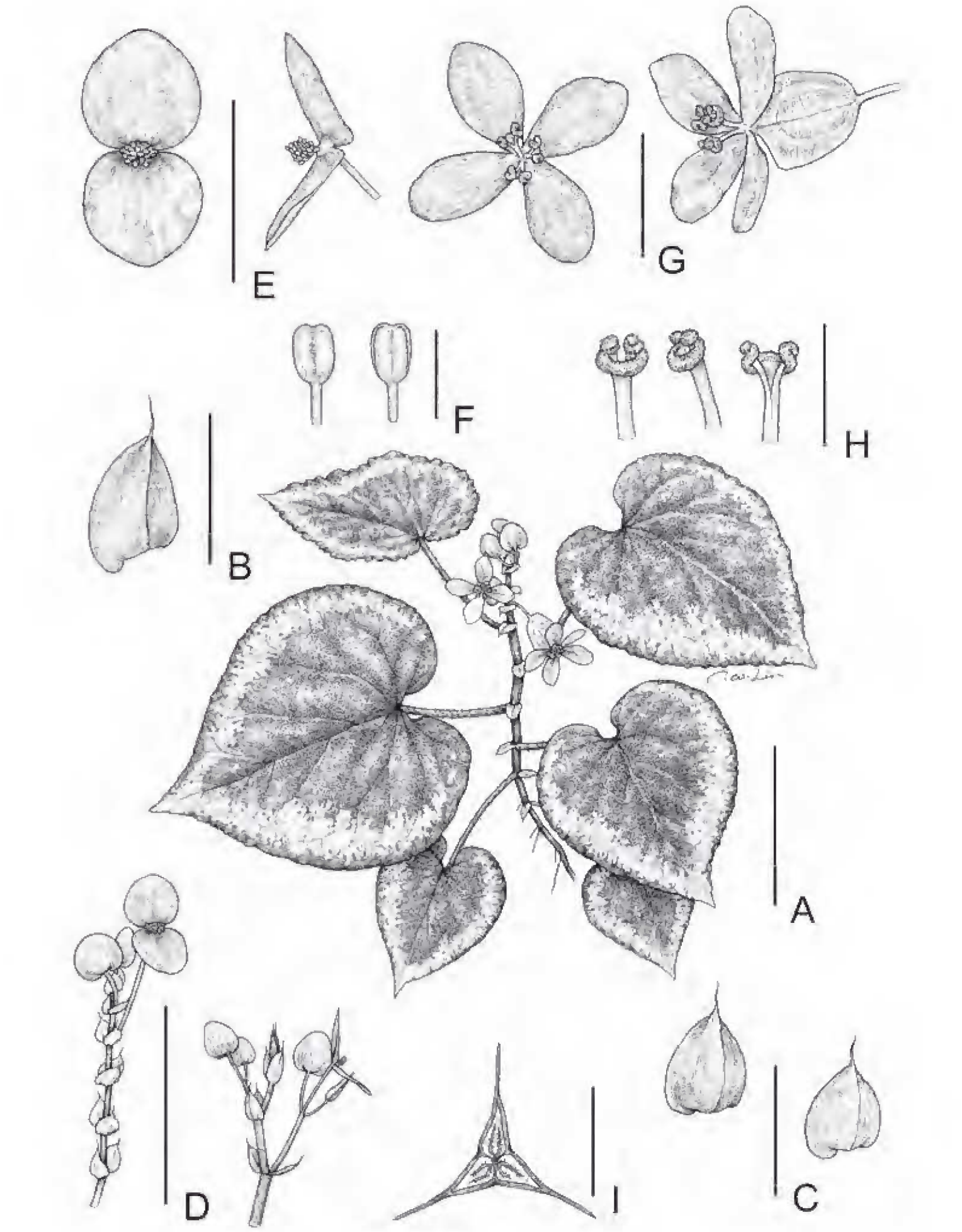

Fig. 1. *Begonia ignita* C.W.Lin & C.I Peng. **A.** Habit. **B.** Stipule. **C.** Bracts at lowermost and uppermost parts of inflorescence. **D.** Male inflorescence parts showing basal few-flowered cymes and distal nodes bearing single flowers. **E.** Staminate flower, face and side views. **F.** Stamen, dorsal and ventral views. **G.** Pistillate flower, face and side views. **H.** Style, dorsal, side and ventral views. **I.** Cross section of an ovary. Scale: A, D: 5 cm; E: 2 cm; B, C, G: 1 cm; H: 5 mm; F: 2 mm. Drawn by C.W. Lin.

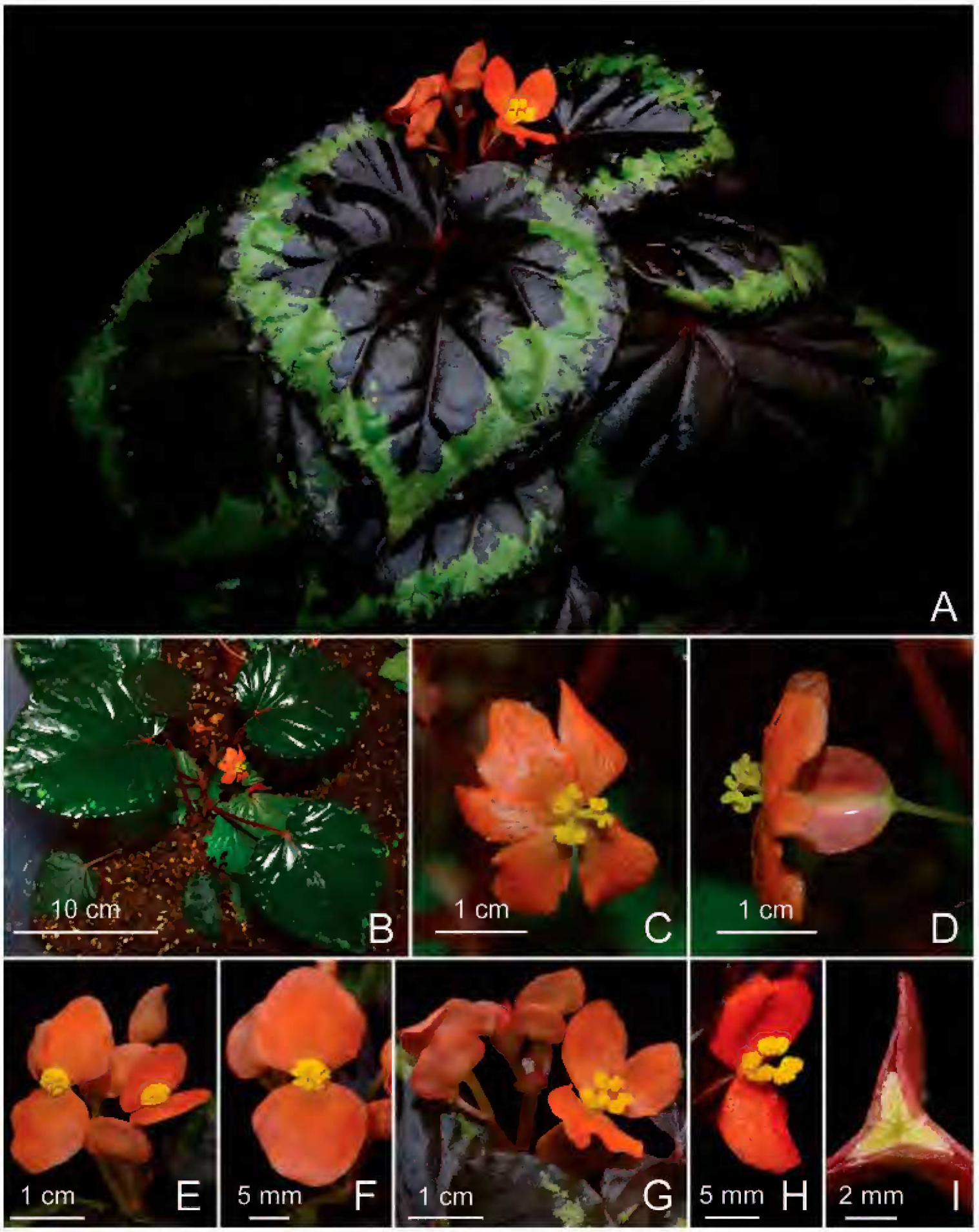

Fig. 2. *Begonia ignita* C.W.Lin & C.I Peng. **A, B.** Habit, showing variation in leaf colours. **C, D.** 5-tepaled pistillate flower (occasional), face and side views. **E.** Inflorescence, showing 2-tepaled staminate flowers. **F.** Staminate flower, face view. **G.** 4-tepaled pistillate flower in inflorescence. **H.** 2-tepaled pistillate flower (occasional). **I.** Cross section of ovary showing axile, bilamellate placentae. (Photos: Y.-Z. Siaw)

at base; anthers c. 0.8 mm long, oblongoid, subequal in length to filaments. ***Pistillate flower:*** pedicel 6–13 mm long, glabrous; *tepals* 4 (rarely 2, 3 or 5), pale orange to vermilion, ovate or obovate to oblanceolate, 9–15 mm long, 4–10 mm wide, glabrous; *ovary* reddish, body trigonous-ellipsoid, 9–11 mm long, c. 7 mm across, 3-winged; wings cuneate or rounded at base, truncate or rounded at the apex, 12–15 mm long, 2–4 mm wide, locules 3, placentae axile, bilamellate; styles 3, yellow, bifid, c. 4 mm long; stigmas in a spiral band and papillose all around. ***Fruits*** not seen.

Distribution. Only known from cultivation; likely endemic to Sulawesi (see Notes).

Etymology. The specific epithet refers to the flame-coloured tepals (Latin: igneus – flame-coloured).

Notes. Begonia ignita has entered into cultivation and is grown by various amateur enthusiasts and *Begonia* collectors inside and outside of Indonesia. The origin of these cultivated plants remains obscure. Enquiries about the species' origin with several growers indicated that most acquired the plants from material cultivated by other growers. This is also the case for the plants cultivated at Bogor Botanic Gardens on which the description is based. Some growers indicated that a market in Sulawesi was the likely original source of the plants, but they could not provide any additional information on the location of this market (province, city etc.). Phylogenetic reconstructions using chloroplast DNA sequence data of *Begonia ignita* (*ndh*A intron, *ndh*F–*rpl*32 spacer, *rpl*32–*trn*L spacer, unpublished data, D. Thomas) integrated with previously published data of other Asian taxa (Thomas et al., 2012; Moonlight et al., 2015), including accessions of about 74% of the currently accepted species from Sulawesi, corroborate a putative Sulawesi origin. *Begonia ignita* is retrieved in a well-supported clade of Sulawesi endemics in *Begonia* section *Petermannia*. It is sister to a well-supported clade including two subclades: a subclade of endemic species distributed on the northern arm of Sulawesi, and a subclade of species endemic to eastern Central Sulawesi.

Begonia ignita is one of the most distinct and most beautiful Indonesian species in cultivation. Its colourful cordiform leaves adorned with a silvery green band or maculation running inside the margin, and the showy flammate flowers immediately make it a very attractive species. It is distinct from all other Sulawesi begonias by the symmetric or subsymmetric cordiform leaves and in being the only known orange-flowered *Begonia* on the island. The new species resembles the Sulawesi endemic *Begonia mendumiae* M.Hughes (sect. *Petermannia*) in the creeping habit, and the band or maculation of the leaves but can be easily differentiated from *B. mendumiae* by the characters shown in Table 1.

Table 1. Comparison of *Begonia ignita* C.W.Lin & C.I Peng and *B. mendumiae* M.Hughes.

	B. ignita (Figures 1, 2)	***B. mendumiae*** (Hughes, 2006: Figures 1, 5)
Stem vestiture	Glabrous	Hairy
Leaf		
Shape	Cordiform, symmetric or subsymmetric	Ovate, strongly asymmetric
Size (cm)	7–12 × 6.5–11	to 9 × 6
Vestiture	Glabrous	Pinkish-red hairy
Bract length (mm)	4–12	c. 4
Inflorescence		
Staminate part	Partial inflorescences with (1–)2–3 flowers	Partial inflorescences with 6–8 flowers
Staminate flower		
Tepal colour	Orange or pale tangerine to vermilion	Pale dusky pink
Anther colour	Yellow	Orange
Pistillate flower		
Number of tepals	(2–)4(–5)	5
Tepal colour	Pale orange to vermilion	Dusky pink
Tepal margin	Glabrous	Sparsely fimbriate
Style colour	Yellow	Orange
Ovary	Glabrous	Hairy

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References

Ardi, W.H., Ardaka, I.M., Hartutiningsih, Lugrayasa, I.N. & Thomas, D.C. (2014). Two new species of *Begonia* (Begoniaceae) from Sulawesi, Indonesia. *Edinburgh J. Bot.* 71: 259–268.

Cannon, C.H., Summers, M., Harting, J.R. & Kessler, P.J.A. (2007). Developing conservation priorities based on forest type, condition, and threats in a poorly known ecoregion: Sulawesi, Indonesia. *Biotropica* 39: 747–759.

Girmansyah, D., Wiriadinata, H., Thomas, D.C. & Hoover, W.S. (2009). Two new species and one new subspecies of *Begonia* (Begoniaceae) from Southeast Sulawesi, Indonesia. *Reinwardtia* 13: 69–74.

Hughes, M. (2006). Four new species of *Begonia* (Begoniaceae) from Sulawesi. *Edinburgh J. Bot.* 63: 191–199.

Hughes, M., Moonlight, P., Jara, A., Tebbitt, M. & Pullan, M. (2015). *Begonia Resource Centre*. http://elmer.rbge.org.uk/begonia/. Accessed 6 Dec. 2016.

Joffre, A.A., Kiew, R., Julia, S. & Rimi, R. (2015). The Begoniaceae of Brunei Darussalam, Borneo, including two new species. *Sandakania* 20: 7–50.

Kiew, R., Julia, S., Rimi, R. & Joffre, A.A. (2015). *A Guide to Begonias of Borneo*. Kota Kinabalu: Natural History Publications (Borneo).

Low, Y.W., Joffre, A.A. & Muhammad Ariffin, A.K. (2015). Novitates Bruneienses, 2. A remarkable new species of *Begonia* sect. *Petermannia* (Begoniaceae) from Brunei Darussalam. *Gard. Bull. Singapore* 67: 61–68.

Moonlight, P.W., Richardson, J.E., Tebbitt, M.C., Thomas, D.C., Hollands, R. & Hughes, M. (2015). Continental-scale diversification patterns in a mega-diverse genus: the biogeography of Neotropical *Begonia* L. *J. Biogeogr.* 42: 1137–1149.

Thomas, D.C. & Hughes, M. (2008). *Begonia varipeltata* (Begoniaceae): A new peltate species from Sulawesi, Indonesia. *Edinburgh J. Bot.* 65: 369–374.

Thomas, D.C., Ardi, W.H. & Hughes, M. (2009a). Two new species of *Begonia* (Begoniaceae) from Central Sulawesi, Indonesia. *Edinburgh J. Bot.* 66: 103–114.

Thomas, D.C., Ardi, W.H., Hartutiningsih & Hughes, M. (2009b). Two new species of *Begonia* (Begoniaceae) from South Sulawesi, Indonesia. *Edinburgh J. Bot.* 66: 229–238.

Thomas, D.C., Ardi, W.H. & Hughes, M. (2011). Nine new species of *Begonia* (Begoniaceae) from South and West Sulawesi, Indonesia. *Edinburgh J. Bot.* 68: 225–255.

Thomas, D.C., Hughes, M., Phutthai, T., Ardi, W.H., Rajbhandary, S., Rubite, R., Twyford, A.D. & Richardson, J.E. (2012). West to east dispersal and subsequent rapid diversification of the mega-diverse genus *Begonia* (Begoniaceae) in the Malesian archipelago. *J. Biogeogr.* 39: 98–113.

Thomas, D.C., Ardi, W.H., Girmansyah, D. & Hughes, M. (2013). *Sulawesi Begonia Data Portal*. http://portal.cybertaxonomy.org/flora-malesiana-prospective/. Accessed 13 Dec. 2016.

Wiriadinata, H. (2013). A new species of *Begonia* (Begoniaceae) from South Sulawesi, Indonesia. *Reinwardtia* 13: 445–448.